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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,380	10/29/2003	Saravuth Sirinorakul	NSE009 US	6795

34036 7590 03/22/2005

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EXAMINER

EVERHART, CARIDAD

ART UNIT PAPER NUMBER

2891

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/696,380

Applicant(s)

SIRINORAKUL ET AL.

Examiner

Caridad M. Everhart

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27-32 is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-8, 11-18, 21 and 23-26 is/are rejected.
- 7) ☒ Claim(s) 4, 5, 9, 10, 19, 20 and 22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 6 recites the limitation "said second metal " in line 2 of claim 6. There is insufficient antecedent basis for this limitation in claim 1 from which claim 6 depends.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,2,6, and 7 rejected under 35 U.S.C. 102(b) as being anticipated by Zalesinski, et al (US 5,567,984).

Zalesinski, et al. Disclose a semiconductor die(feature 2 in Fig. 4 and col. 2,lines 47-50), a capsule enclosing the die(feature 7 in Fig. 4, and described in col. 3,lines 14-15), a plurality of metal studs (feature 8 in Fig. 4 and col. 3, ilnes 15-17), and bonding wires (3 in Fig. 1 and col. 2,lines 49-50). The studs can be seen to have flat surfaces.

Claims 1,2,6,7, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Choi(US 5,693,573).

Choi discloses a semiconductor die (feature 15 in Fig. 4D and col. 2,lines 65-67), metal studs (features 14 in Fig. 4D and col. 2, lines 50-55) which can be seen to have a flat bottom surface, and bonding wires (feature 17 in Fig. 4D and col. 3, lines 17-20). The

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wires 17 are connected at a location which is considered adjacent to the studs since the features 13b are connected to the studs. The studs comprise a second metal on the surface of a first metal (features 13a are considered the first metal col. 2, lines 48-50 ; features 14 are the second metal col. 2, lines 50-64). Choi teaches a die attach pad(col. 3, lines 12-16).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3,8,12, 14-18, 21, and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi as applied to claim 1 above.

Choi does not disclose the recited materials nor the plurality of rows of studs nor the thickness or dimensions of the die-attach pad.

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With respect to the copper material, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used copper in the device taught by Choi for the frame because copper is conventional in the art in the formation of package frames.

With respect to the plurality of rows of studs, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used a plurality of rows in the device taught by Choi because the cross-sectional view could be repeated to produce a plurality of rows of the studs because the cross-sectional view only shows a portion of the device.

With respect to the die-attach pad, the portion on which the die is attached satisfies the limitation of a die-attach pad, and the tape taught by Choi(col. 3, lines 12-16). It would have been obvious to one of ordinary skill in the art at the time of the invention to have used a tape that has epoxy adhesive in the device taught by Choi because the use of epoxy adhesive is conventional in the art. With respect to the dimensions of the die attach pad, this is a variable of the art which one of ordinary skill in the art would be able to choose, for example taking into account the desired strength of the bonding and the desired heat-transfer desired.

***Allowable Subject Matter***

Claims 27-32 are allowed.

Claims 4,5,9,10,19,20, and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. Everhart  
3-21-2005

*C. Everhart*  
C. EVERHART  
PATENT EXAMINER